

<p align="center">Appendix 9 – GRIM3</p>	<p align="center">Page 1 of 2</p>
<p align="center">Division of Forensic Science</p> <p align="center">TRACE EVIDENCE PROCEDURES MANUAL</p>	<p>Amendment Designator: A</p>
	<p>Effective Date: 13-July-2007</p>
<p align="center">9 GLASS REFRACTIVE INDEX MEASUREMENT SYSTEM (GRIM 3)</p> <p>A. Calibration</p> <ol style="list-style-type: none"> a. Calibration of the instrumentation is performed on an annual basis for the silicone oil and interference filter being used in casework. The calibration data is used by the GRIM3 system to determine refractive index at the given filter wavelength. The system is calibrated with the 589 nm interference filter using Locke Scientific Silicone Oil B and the Locke Scientific B Series of glass standards (B2 –B4; B6-B12) using the declared RI values. Five readings from five glass particles are obtained from one prepared slide of each of the Locke Scientific B Series glass standards used. The calibration correlation value must be less than or equal to -0.99990. The dRI must be between -10 and +10 inclusive for each standard glass analyzed. New slides of the Locke B standards will be prepared annually. Store the slides in a desiccator. b. The calibration of the GRIM3 system using the Locke B oil will be checked using Locke glass standards B3, B6 and B11 taking five readings from five glass particles from one prepared slide. The mean of the five readings will be compared to the declared certificate value for the B3, B6 and B11 glasses. This value must be +/- 0.00010 of the declared certified value. c. If headlight glass is encountered, the GRIM3 is calibrated at 589 nm using Locke Scientific Silicone Oil C and the Locke Scientific C Series of glass standards using the RI values from the table in the Locke manual that are closest to the match temperature of the glasses used. Five readings from five particles are obtained from one prepared slide of each of the appropriate glass standards. The calibration correlation value must be less than or equal to -0.99990. The dRI must be between -10 and +10 inclusive for each standard glass analyzed. Prepare glass standard slides, as appropriate, and retain for no greater than one year. Store the slides in a desiccator. This calibration for headlight glass is good for one year from the date it was obtained. d. The calibration of the GRIM3 system using the Locke C oil will be checked with NIST SRM 1820 taking five readings from five glass particles from one prepared slide. The mean of the five readings will be compared to the certificate value for the SRM. This value must be +/- 0.00010 of the certificate value for the SRM. New slides of the SRM will be prepared annually as needed. Store the slide in a desiccator. Since the use of this oil is non-routine, the data will be printed and retained in the case file. Additionally, this data will be photocopied and retained in the QA binder for the equipment. e. If glass is encountered which has a very high refractive index that is above the range of the Locke Scientific Silicone Oil B, the GRIM3 can be calibrated at 589 nm using Locke Scientific Silicone Oil A and the Locke Scientific A Series and B Series of glass standards, as appropriate, using RI values from the table in the Locke manual that are closest to the match temperature of the glasses used. Five readings from five particles are obtained from one prepared slide of each of the appropriate glass standards. The calibration correlation value must be less than or equal to -0.99990. The dRI must be between -10 and +10 inclusive for each standard glass analyzed. Prepare glass standard slides, as appropriate, and retain for no greater than one year. Store the slides in a desiccator. This calibration for glass with a very high refractive index is good for one year from the date it was obtained. f. The calibration of the GRIM3 system using the Locke A oil will be checked using Locke glass standard A4. Five readings from five particles are obtained from one prepared slide of each of the appropriate glass standards. The mean of the five readings will be compared to the RI value from the table in the Locke manual for A4 and must be +/- 0.00010 of the RI value from the table in the Locke manual for A4. Since the use of this oil is non-routine, the data will be printed and retained in the case file. Additionally, this data will be photocopied and retained in the QA binder for the equipment. g. The calibration data will be printed and retained in a binder which will be maintained with the equipment. 	

<p align="center">Appendix 9 – GRIM3</p>	<p align="center">Page 2 of 2</p>
<p align="center">Division of Forensic Science</p> <p align="center">TRACE EVIDENCE PROCEDURES MANUAL</p>	<p>Amendment Designator: A</p>
	<p>Effective Date: 13-July-2007</p>
<p>B. Monthly QA</p> <p>a. The Mettler hot stage on the GRIM3 system will be inspected internally for residual mounting oil. In addition, the glass slide that is positioned in the hot stage under the objective opening will also be inspected. Set the hot stage temperature to a low setting and clean the hot stage and glass slide with methyl or isopropyl alcohol as needed.</p> <p>b. The calibration will be checked using Locke glass standards B3, B6 and B11 in the Locke Silicone Oil B. Five readings from five particles are obtained from one prepared slide of each of the appropriate glass standards. The mean of the five readings will be compared to the certificate value for the B3, B6 and B11 glasses. These values must be +/- 0.00010 of the declared certified value.</p> <p>c. The monthly QA check data will be printed and retained in a binder which will be maintained with the equipment.</p> <p>C. Day-of-Use QA</p> <p>a. The calibration will be checked using Locke glass standards B3, B6 and B11 in the Locke Silicone Oil B. Five readings from five particles are obtained from one prepared slide of each of the appropriate glass standards. The mean of the five readings will be compared to the certificate value for the B3, B6 and B11 glasses. These values must be +/- 0.00010 of the declared certified values for the B3, B6 and B11 glasses. Include the data for this QA check with each case file analyzed that day. The Day-of-Use QA is not necessary when it would be completed on the same day as the Monthly QA.</p> <p>D. Case-by-Case QC Check</p> <p>a. For each case examined with a single known glass sample, a single glass standard is analyzed using the appropriate wavelength and oil. The Locke glass standard selected for this QC check will be that which is closest to the refractive index value of the known glass. If multiple known glass samples of different refractive indices are present, then multiple glass standards will be necessary. Five readings from five particles are obtained from one prepared slide of each of the appropriate glass standards. The mean of the five readings will be compared to the certificate value for the glass standard(s). This value must be +/- 0.00010 of the declared certified value.</p> <p align="right">◆End</p>	